Homework #4

Q1:(10pts) Create two functions that calculate *variance* and *standart deviation* of an arbitrary `x` vector. Do not use R's `sd` and `var` functions (remember HW #1).

```
myvar <- function(x) {
# Fill here
}

mysd <- function(x) {
# Fill here
}
```

Q2:(10pts) A dependent function chain is defined as $h(x) = \frac{log(x)-1}{\sqrt{x}}$, $g(x) = e^{\sqrt{h(x)}}$ and $f(x) = \sin g(x)^{\cos g(x)}$. Create functions for each of them and solve `f(x)` for `x <- 4:250`.

Q3:(20pts) Create a function that calculates number of exceedence of a specified threshold in an arbitrary `x` vector.

```
exeedence <- function(x, threshold) {
# Fill here
}
```

Q4:(20pts) Create a function that calculates slopes between points in an arbitrary `x` and `y` vector pairs. Function MUST make sure length of `x` and `y` vectors are equal.

```
slope <- function(x, y) {
# Fill here
}
```

Q5:(10pts) Create a function calculates the sum of digits of any integer. For instance, sum of digits of `385102` is `3 + 8 + 5 + 1 + 2 = 19`.

```
sumofdig <- function(x) {
# Fill here
}
```

Q6:(30pts) By using the function in Q5, create a function calculates count of numbers whose sum of digits is `m` in an integer `x` vector. For instance, there are `2` numbers whose sum of digits is `5` between `10` and `30`.

```
numofsumofdig <- function(x, m = 20) {
# Fill here
}
```